

Project Closure Document

OSG Resource Selection Service (Phase II)

Table of Contents

1.	Approvals.....	3
2.	Document Change Log	4
3.	Project Abstract.....	5
4.	Project Proposal Lead.....	5
5.	Project Documentation	5
6.	Reason for Closing the Project	5
7.	Project Deliverables.....	6
7.1	Deliverables in initial plan	6
8.	Project Schedule	7
9.	Project Team.....	8
10.	Budget and Financial Information	8
10.1	Personnel Cost.....	8
10.2	Hardware Cost.....	8
11.	Outstanding Risks	9
12.	Operations and Support	9
12.1	Operations.....	9
12.2	Support	9
12.3	Maintenance.....	10
13.	Next Steps.....	10
14.	Lessons Learned	10

1. Approvals

CMS VO Representative:

Signature:

Date:

Print Name: Burt Holzman

Title:

DES VO Representative:

Signature:

Date:

Print Name: Nickolai Kouropatkine

Title:

**DZero VO
Representative:**

Signature:

Date:

Print Name: Joel Snow

Title:

**Engagement VO
Representative:**

Signature:

Date:

Print Name: Mats Rynge

Title:

**FermiGrid
Representative:**

Signature:

Date:

Print Name: Keith Chadwick

Title:

OSG Representative:

Signature:

Date:

Print Name: Mats Rynge

Title:

Sponsor:

Signature:

Date:

Print Name: Gabriele Garzoglio

Title: Application Developer and System Analyst

Project Leader:

Signature:

Date:

Print Name: Parag Mhashilkar

Title: Application Developer and System Analyst

2. Document Change Log

Version	Date	Change Description	Prepared By
V 1.0	08/18/2010	First Version of the Document	Parag Mhashilkar

3. Project Abstract

During the Phase I of the Resource Selection Service (ReSS) project, the project team developed, integrated, and deployed a registration and selection service for computing and storage resources on the Open Science Grid. ReSS is used by members of Virtual Organizations (VO) in the Open Science Grid (OSG) to select appropriate resources to run jobs. In phase II, the ReSS project worked on providing additional features like, support for MPI, support for SE information in the classads, secure resource registrations and several other features required to transition the project to operations. ReSS project operations are currently supported by FermiGrid.

4. Project Proposal Lead

Project Leader : Parag Mhashilkar
Department : Computing Division
Group : SCF/GRID/DOCS

5. Project Documentation

This section lists supporting documentation released during the lifecycle of the ReSS project.

The project web home page:

<https://twiki.grid.iu.edu/twiki/bin/view/ResourceSelection/>

This link includes documentation for:

Phase – I

1. Project definitions, including charter, user requirements, initial plan and architecture;
2. System and component evaluations
3. Design and development documentation
4. User and administrator documentation
5. System deployment and monitoring tools
6. List of related publications
7. Phase – I closeout document

Phase – II

The documents listed under Phase – I also apply for Phase – II. The ReSS project home page mentioned above also includes following documentation that is specific to Phase – II of the project.

1. Project Definition document (includes WBS)
2. ReSS Security Review
3. Phase – II closeout document

6. Reason for Closing the Project

Phase II of the ReSS project was started in Sep 2008 to add new features to the ReSS project. Some of the features requested were, support for MPI, support for advertising SE, improved robustness through HA, etc.

The project has achieved the initial goals stated in the charter (see “project deliverables” section). Furthermore, it has provided additional features as per user change-requests made by the stakeholders during the lifetime of the project.

As of now there are no outstanding user requests known to the project. The ReSS services have been transitioned to operation and are well supported by the FermiGrid group. If there are any user requests in future and if the need be to add features to the existing ReSS services, we propose to open a new phase of the ReSS project with a new project definition that is adequate to the changed needs of the community.

7. Project Deliverables

This section lists high-level deliverables for the Phase – II of the ReSS Project. Work related to following ongoing activities mentioned below is not listed in the table.

1. Supporting users in improving and/or bootstrapping the integration of ReSS with their job management systems
2. Testing new releases of CEMon
3. Providing consultation for existing CEMon deployments at sites

7.1 Deliverables in initial plan

Planned Deliverables	Actual Deliverables
Support for MPI users	Successful implementation and deployment of feature in resource publishing mechanism in CEMon that allows the OSG sites to advertise Glue attributes to enable match making for MPI jobs.
Improved support for the registration of Storage Elements with ReSS	Successful implementation and deployment of features in resource publishing mechanism in CEMon to enable Storage elements associated with a site to advertise storage related information associated with the computing elements.
Test suite to identify installation/deployment issues	Successful implementation of the test suite to identify deployment and configuration issues (on limited scale concerned with CEMon).
Compliance with the Generic Information Services for OSG 1.2	Successful implementation and deployment of changes to ReSS to comply with GIP for OSG 1.2
Compliance with the Generic Information Provider to support Glue Schema V2	None. At the time of closing this project, Glue Schema V2 is not yet supported by OSG.
Improved security for resource registration with ReSS	Successful implementation of Information Gatherer (IG) that generates ‘allow’ and ‘deny’ files listing hostnames. The allow file can be auto generated from the officially OSG registered resource list available in OIM database.
Support to run ReSS services in the High Availability deployment mode	Changes to ReSS that resulted in successful deployment of ReSS services in HA mode.
Compliance of ReSS with the FermiGrid Software Acceptance Process	Documentation and release process that complies with FermiGrid Software Acceptance Process.

Change Requests	Actual Deliverables and Impact
Better monitoring of classads in ReSS to capture HA aspect	Successful implementation of the monitoring tool that captures the number of classads from each site in each of the ReSS HA services. Impact: 3 FTE weeks of unplanned effort to implement and test the monitoring tool.
RSV Probes that perform necessary checks on the CE node	Successful implementation and deployment of RSV probes that run tests available through test suite. Impact: 1 FTE month of unplanned effort to understand RSV protocol, implement RSV probes and make them available through VDT.
ReSS Security Review	Conducted a security review of the ReSS project. Findings of the security review are documented in http://cd-docdb.fnal.gov/cgi-bin/ShowDocument?docid=3021 Impact: 2 FTE days of unplanned effort for the review.

8. Project Schedule

Following table lists the Milestones and their schedule.

Milestones/Deliverables	Requester / Stakeholder	Planned For	Completion Date
Support for MPI users ➤ Successful implementation and deployment of features in resource publishing mechanism in CEMon that allows the OSG sites to advertise Glue attributes that enable match making for MPI jobs.	OSG	12/31/2008	12/31/2008
Improved support for Storage Elements registration with ReSS ➤ Successful implementation and deployment of features in resource publishing mechanism in CEMon to enable Storage elements associated with a site to advertise storage related information separately from computing elements.	OSG	12/31/2008	12/31/2008
Test suite to identify installation/deployment issues ➤ Successful implementation of the test suite to identify deployment and configuration issues (on limited scale concerned with CEMon) related issues.	ReSS	03/31/2009	05/07/2009
Compliance with the Generic Information Services for OSG 1.2 ➤ Successful implementation and deployment of changes to ReSS to comply with GIP for OSG 1.2	OSG	02/28/2009	07/27/2009 (OSG 1.2 release)

Compliance with the Generic Information Provider to support Glue Schema V2 ➤ Successful implementation and deployment of changes to ReSS to comply with GIP that supports Glue Schema V2	OSG	TBD (Based on GIP schedule)	Not Completed
Improved security for resource registration with ReSS	ReSS, OSG, Engagement	11/30/2009	08/12/2010
Support to run ReSS services in High Availability deployment mode ➤ Support in ReSS to run under HA mode	FermiGrid	03/31/2009	06/17/2009
Compliance of ReSS with the FermiGrid Software Acceptance Process	FermiGrid	09/31/2009	09/15/2009
ReSS Security Review ➤ Conduct a security review of the ReSS project	Computing Division	10/31/2009	11/06/2009

9. Project Team

Name	Project Role	Ramp-down Plan	Timeframe
Parag Mhashilkar	Project Leader	No development foreseen in the near future. Ramp down effort to consulting and emergency maintenance only starting September 2010	Ramp down effort to consulting and emergency maintenance only starting September 2010

10. Budget and Financial Information

10.1 Personnel Cost

- S&W budget was planned at 20% FTE for Project Leadership + 30% FTE for development, integration and support of project related activities.
- The project was delayed due to following reasons –
 - Delays in the deployment of certain dependent tasks
 - Underestimation in the amount of development/integration needed
 - Accepted several change requests (see above) during the life cycle of the project that were not included in the initial plan
 - Reduction in the amount of FTE effort allotted to the project from October 2009

10.2 Hardware Cost

- FermiGrid hosts the production and ITB ReSS-HA services and also provides development hosts for ReSS software development. The system deployment utilizes the standard FermiGrid Xen Dom-0 and Dom-U approach coupled with a dedicated LVS front end.

11. Outstanding Risks

Risk	Impact Level	Risk Plan Actions
Support for CEMon dropped by GLite	High	This will need working closely with GIP group to find an alternative means to achieve the functionality provided by CEMon in case this happens. OSG can also evaluate and adopt advertising tool developed by Brian Bockelman. This tool is currently deployed on Compute elements in University of Nebraska at Lincoln. Chance of support for CEMon being withdrawn by the CEMon group is minimal but the impact on OSG Information Services could be significant.
Adaptation to GLUE Schema V2	Medium	At the time of closing this project, OSG has yet to adapt Glue Schema V2. The changes to adapt Glue Schema V2 could be complex and may not integrate with the existing ReSS services.

12. Operations and Support

12.1 Operations

The Resource Selection service consists of 3 logical components: (1) a site-deployed service (CEMon); (2) a suite of central services; (3) monitoring tools and web pages.

Site-deployed services are deployed via VDT and operated by sites.

Central services are deployed on 4 VMs at Fermilab: 2 for resource selection on OSG production deployment (osg-ress-1.fnal.gov), 2 for resource selection on the ITB (osg-ress-4.fnal.gov). Production and ITB services run in HA mode and are operated by FermiGrid.

Monitoring tools run as a set of cron jobs on osg-ress-1.fnal.gov. The tools require minimal operational effort and are maintained by the FermiGrid.

Parag Mhashilkar will ramp down the effort to consulting and emergency maintenance only mode starting September 2010.

12.2 Support

ReSS is supported by the ReSS team and FermiGrid group based on the nature of support requested. Requests for support are submitted by users to the OSG Grid Operation Center (GOC). GOC generates tickets and forwards them to the Computing Division service desk, with enough information so that the tickets can be further routed to –

- ReSS Developer's Support Group (ress-support@fnal.gov):
Tickets that fall under following criteria
 - Questions related to advertising site information using CEMon
 - Site(s) not reporting to ReSS
 - How to extract required information from ReSS

- Possible bugs preventing site(s) to advertise to ReSS or possible bugs such that site advertise incorrect information.
- Fermigrid Support Group:
 - Tickets that fall under following criteria
 - Disruption of ReSS service(s)
 - The service cannot be contacted
 - Machine hosting the service is not reachable

12.3 Maintenance

ReSS is an integration project based on Condor, CEMon and Tomcat. Condor components are maintained by the Condor Team at the University of Wisconsin, Madison. CEMon is maintained by gLite, INFN Bologna group. Tomcat is an open source project maintained by Apache. All other software components, including an OSG CEMon plug-in, are maintained by the ReSS team.

13. Next Steps

There is no current plan to open a new phase of the project. Starting September 2010, Parag Mhashilkar will ramp down the effort level to consulting and emergency maintenance only as required.

During the execution of the ReSS project, the project group learned several valuable lessons and developed proficiencies in the OSG Information Services. ReSS project recommends the OSG and the Computing Division to involve the members of ReSS team in the investigations on the next generation of OSG's Information Services.

Documentation for the project will be maintained at the project home page, as indicated above.

14. Lessons Learned

The following section describes the lessons learned from the project.

It was not always easy managing the code that depended on third party software, in particular in the case of the OSG plug-in of the CEMon service. The OSG plug-in code is kept in the gLite code repository and it is, to all effects, part of the CEMon project, although it is maintained by Fermilab developers. The collaboration with gLite has worked for the ReSS project because of the responsiveness of the CEMon team; however, the processes to change the OSG plug-in code and to build releases could be simplified and made accessible to the ReSS developers.

The troubleshooting of problems reported by customers was often complicated and time consuming. Failures observed in the ReSS system were often caused by problems in dependent packages, typically GIP, CE security configuration, or Tomcat configuration. After the development of RSV probes that identify some of these issues, number of such problems reported to ReSS team has gone down. Automation of such troubleshooting tasks can be extended to all software in OSG stacks.

ReSS team has worked closely with several OSG VOs to understand their needs. During the execution, the project group learned several valuable lessons and developed proficiencies in the OSG Information Services. ReSS project recommends the OSG and the Computing Division to

involve the members of ReSS team in the investigations on the next generation of OSG's Information Services.

OSG software stack deployed on CEs at site is not always current. As a result these sites miss on some crucial patches and bug fixes and face problems that have been resolved in the updated version of the software. There should be policies to encourage/enforce the sites to deploy the patches more rapidly and also make the upgrade process much transparent to the sites.